Updated 5/20/05

Objective	Action	Isl	EG	Task Force	Chair Liaison	Due Date	Status	Follow-up action needed	RCG lead
1 DEVELOP AND REGULARLY UPDATE RECOVERY TARGETS FOR EACH ISLAND'S POPULATION.	Analysis 1.1 Develop island-specific population viability analyses based on the most up-to-date information on fox status, demography, and genetics on each island, taking into account both wild and captive populations.	SR SCz SCt SN SCl	PM WP CP G FH	PVA Work Grp	N/A	N/A	PVA Workshop postponed to 4/05		RS
	Analysis 1.2 Build on PVA models (developed in Analysis 1.1) and other data to develop criteria to determine the conditions in the wild that would trigger the initiation (and termination) of releases of captive-bred foxes.	SM SR SCz SCt	PM WP CP R				ANALYSIS REQUEST NOT ISSUED		
	Analysis 1.3 Use the PVA models (developed in Analysis 1.1) and supporting data to determine the conditions in the wild populations that would trigger taking additional foxes into captivity (e.g., during pig eradication on Santa Cruz, or if another disease outbreak occurred). NOTE: Contingency plans for intervention are developed in Analyses 4.2 and 5.2.	SR SCz SCt	PM WP CP	1	Gary Roemer	7/31/04	Delivered to RCG 9/13/04 RCG issued response in a memorandum 4/13/05		RW
2 MONITOR WILD FOX POPULATIONS WITH SUFFICIENT PRECISION AND FREQUENCY TO DETECT CHANGES IN POPULATION DYNAMICS AND CHANGES IN THREATS.	Analysis 2.1 Develop island-specific and cross-island monitoring plans for wild fox populations, including monitoring for causes of death. Use the PVA models (developed in Analysis 1.1) to improve the monitoring program (e.g., to identify vital rates that must be measured more precisely to estimate lambda with the required confidence).	SR SCz SCt SN SCl	PM WP G FH	2	Gary Roemer	8/31/04	Outline promised by Gary for presentation at PVA workshop		
	Analysis 2.2 Develop standards for data collection, metadata archiving, and data sharing.	SM SR SCz SCt SN SCl	PM WP CP				ANALYSIS REQUEST NOT ISSUED		
	Analysis 2.3 Develop recommendations for collection and management of tissue/blood samples.	SM SR SCz SCt SN SCl	FH G WP CP				ANALYSIS REQUEST NOT ISSUED		
3 DEVELOP AND MANAGE CAPTIVE BREEDING FACILITIES IN A COORDINATED MANNER TO PROMOTE RECOVERY OF LISTED SUBSPECIES.	Analysis 3.1 Determine target long-term captive population sizes required for each subspecies—including the number of captive subpopulations required—using PVA models, existing demographic and genetic data, and the number of captive animals required for annual production for release.	SM SR SCz SCt	PM CP WP G FH				Analysis Request revised by DK based on conversations with RCG on 8/16/04 ANALYSIS REQUEST NOT ISSUED		
	Analysis 3.2 Determine the environmental, genetic, and social variables correlated with successful captive breeding of Channel Island foxes by comparing the husbandry and management of captive foxes on Santa Rosa, Santa Cruz, Santa Catalina and San Miguel Islands. Environmental variables could include siting of the facility (average temperature, humidity, available shade, topography, wind exposure), number of cages per facility, distance between cages, potential visual, olfactory and auditory contact by foxes between cages, access to site by wild foxes, cage size, cage shape, cage furnishings (e.g., number, siting and height of resting sites, number, sizes and shapes of nest boxes, number and siting of below ground denning areas, amount and type of natural vegetation within cage), distance of facility to public areas/ trails, percent of cage with tennis netting used for visual barriers and wind control, number and frequency of enrichment items offered, daily diet and feeding schedule (including feeding location, frequency and type of live food offered, frequency and type of dead carcasses offered), frequency and mode of capture, frequency and type of veterinary treatment, and amount and type of training for management (capture and handling). Social variables could include degree of mate choice offered prior to setting up pair for breeding, comparative analysis of pair behaviors for pairs that have	SM SR SCz SCt	CP G				Analysis Request revised by DK based on conversations with RCG on 8/16/04 Carlstead proposal discussed by RCG on 2/23/05 Review of proposal by members of CP and Garcelon, Vickers, Coonan, Morrison, and Vermeer requested on 2/24/05 ANALYSIS REQUEST NOT ISSUED	Review of proposal by members of CP and Garcelon, Vickers, Coonan, Morrison, and Vermeer expected by 3/11/05	LC

									Updated 5/20/05
Objective	Action	Isl	EG	Task Force	Chair Liaison	Due Date	Status	Follow-up action needed	RCG lead
	and have not bred, and keeper opinions concerning what characterizes a good breeding pair. Stress variables could include a keeper survey to determine which individuals keepers believe are more fearful, shy, stressed, etc. and a cross-sectional analysis of fecal corticoid levels in all breeding and non-breeding pairs, to be compared with corticoid levels in wild pairs.								
	Analysis 3.3 Determine the process, including roles and responsibilities, quarantine requirements, and the timeline for moving Channel Island foxes to zoos and breeding facilities on the mainland to form breeding subpopulations of one or more subspecies (which subspecies to be established will depend on results from TAR 3.1). NOTE: Risk analysis for movement to the mainland has already been completed, but there is a need for further consideration of quarantine procedures (see also Analysis 5.1).	SM SR SCz SCt	CP FH				Analysis Request revised by DK based on conversations with RCG on 8/16/04 REVISED ANALYSIS REQUEST NOT FORMALLY ISSUED Conference call on mainland options held on 9/8/04 in preparation for AZA meeting; proposed administrative procedure for managing island foxes in mainland facilities prepared and distributed by P. Siminski on 9/9/2004; island fox CD, info sheet, and PPT presentation prepared and presented by Alan Varsik et al. at AZA conference 9/04 Linda Munson is developing quarantine procedures to be reviewed by Don Janssen, Scott Citino, and Randy Junge		
	Urgent Related Analysis to Analysis 3.1 and 3.3 Determine whether, how, and where to release captive-bred foxes this fall and, if no releases, develop contingency plans that may include establishing mainland populations or expanding existing on-island populations	SM SR SCz SCt	PM CP WP R G FH	3	Peter Siminski	7/31/04	Analysis delivered to RCG 7/20/04 RCG recommendations transmitted to Land Managers 10/7/04 RCG recommendations and analysis forwarded to IRT 10/14/04 Land Manager responses forwarded to IRT 11/22/04 A memorandum was issued against recaptures of released foxes on SRI 4/8/05.	NONE	N/A
	Analysis 3.4 Develop management and husbandry plans for each subspecies, taking into account studbook data and results from research into best husbandry practices (pen size, social structure, mate choice etc). The focus for research and management for each captive population will depend on the size and stability of that subspecies' wild and captive populations. NOTE: Protocols for mate choice tests have already been proposed.	SM SR SCz SCt	CP R G FH	4	Peter Siminski	9/30/04	Analysis delivered in part to RCG on 10/19/04 and in full to RCG on 2/3/05 RCG recommendations transmitted to Land Managers and FWS response letters 5/3/05	RCG recommendations and analysis forwarded to IRT	
	Analysis 3.5 A. Given the current state of knowledge, develop minimum standardized pre-release	SM SR	CP WP				Analysis request drafted by DK, revised 2/23 based on RCG		

Updated 5/20/05

Objective	Action	Isl	EG	Task Force	Chair Liaison	Due Date	Status	Follow-up action needed	RCG lead
	and post-release management and monitoring protocols for all listed subspecies of island foxes. Ensure compatibility between short-term and long-term monitoring protocols. B. Identify priority research that will permit the comparison of methodologies to determine the most successful pre- and post-release management, i.e., the management protocols that result in the greatest survivorship and reproductive success of released foxes. Variables that need consideration include pre-release housing and adaptation to release sites, feeding regimes, differential fox behavior, social groupings, medical exams, and post-release food supplementation and shelter (how, what, how much, when, for how long).	SCz	R FH				review Analysis request issued on 2/24/05 to Dan Blumstein as Chairperson Liaison with cc to other relevant expertise group chairpersons and Dave Garcelon, Tim Coonan, and Ann Muscat		
	Analysis 3.6 (DRAFT 2/24/05) Captive populations of island foxes on the mainland potentially could contribute to long-term conservation and recovery efforts. A technical analysis is needed to determine whether the establishment of mainland captive populations would be beneficial, given the current existing wild and on-island captive populations, and given the primary goal of increasing the viability of wild populations. The following analyses are requested: 1. Identify and describe the potential benefits and also the potential costs of the following strategies for maintaining captive populations of island foxes: a. using existing on-island facilities b. expanding on-island facilities c. using space in existing mainland facilities (e.g., zoos) d. constructing new mainland facilities for island foxes To the extent possible, quantify the benefit (e.g., % reduction in risk of extinction) or at least categorize each benefit (e.g., critical, beneficial but not critical, low priority, etc.). If possible, summarize the results in tabular form to facilitate comparison among strategies. 2. Identify to the extent possible the steps and their logical progression for establishing and managing captive populations on the mainland (e.g., identifying space, securing permits, addressing on-island and off-island quarantine issues, establishing an oversight strategy [e.g., Species Survival Plan], transporting animals, etc.). 3. Assuming that the establishment of mainland populations is determined to be both desirable and practical, identify weighted criteria to be used to prioritize subspecies of island foxes for representation in mainland populations. Potential criteria to consider for each subspecies could include genetic attributes, status of wild and captive populations, current and potential risks to on-island wild and captive populations, and any special challenges (e.g., Spirocerca and Angiocaulus issues). Relates to: San Miguel, Santa Rosa, Santa Cruz, Santa Catalina. Technical Expertise Groups involved: PM, CP, WP, G, FH. Lead Group: CP.	SM SR SCz SCt	PM CP WP G FH	3.6	Peter Siminski	5/25/05	TAR 3.6 issued 4/12/05 to Peter Siminski as Chaiperson Liaison, TAR due 5/25/05	RCG to review when receive	RCG

Updated 5/20/05

Objective		Action	Isl	EG	Task Force	Chair Liaison	Due Date	Status	Follow-up action needed	RCG lead
4 MANAGE MORTALITY AND MORBIDITY FACTORS AT LEVELS THAT ALLOW FOR THE RECOVERY AND LONG-TERM MAINT-ENANCE OF VIABLE POPULATIONS OF LISTED SUBSPECIES.	4a Reduce golden eagle predation pressure to levels that allow recovery and long-term maintenance of viable populations of listed subspecies.	Analysis 4.1 Analyze efficacy of golden eagle control and capture methods utilized to date and recommend innovative program for removal methods, taking into account the most up-to-date information on the status of the wild fox populations.	SR SCz	GE WP			9/30/04	Analysis delivered to RCG 10/25/04 RCG recommendations transmitted to Land Managers 1/14/04 RCG recommendations and analysis forwarded to IRT 1/27/04 TNC contract and crew for capture and removal of golden eagles at SCz in place as of 1/05 Federal depredation permit issued 2/23/05 for basic eagle removal activities; State permit issued 2/xx/05	Remind Land Managers that responses are needed (?) FWS to complete permit for additional eagle-removal activities ASAP, State to issue parallel permit	LC CB DS
		Analysis 4.2 Building on monitoring data (Analysis 2.1), demographic intervention criteria (Analysis 1.3), and available golden eagle control methods (Analysis 4.1), develop a contingency plan for emergency interventions to protect the wild fox populations from possible golden eagle predation during pig eradication on Santa Cruz Island	SR SCz	PM WP CP				ANALYSIS REQUEST NOT ISSUED		
		Analysis 4.3 Evaluate golden eagle diet, including changes in prey selection in the course of feral pig control, and the possible role of exotic deer and elk on Santa Rosa in sustaining the golden eagle population.	SR SCz	GE				ANALYSIS REQUEST NOT ISSUED		
		Analysis 4.4 Evaluate competitive interactions between golden and bald eagles.	SCz	GE				ANALYSIS REQUEST NOT ISSUED		
	4b Minimize disease threats that adversely affect the long-term viability of any of the listed subspecies.	Analysis 5.1 Review and, where appropriate, refine procedures to minimize the risks of introducing exotic diseases to the islands. This should include quarantine protocols for moving foxes between the islands and the mainland (and possibly between islands) if this is deemed appropriate by risk analyses, but also procedures to minimize risks from domestic dogs and other species that may be brought to the islands.	SM SR SCz SCt SN SCl	FH				ANALYSIS REQUEST NOT ISSUED		
		Analysis 5.2 Building on island-specific PVAs (Analyses 1.1 and 1.3) and monitoring data (Analysis 2.1), develop criteria and protocols for managing wild populations in the event of a disease outbreak that threatens population viability (e.g. taking animals into captivity, emergency vaccination).	SR SCz SCt SN SCl	FH WP CP PM				ANALYSIS REQUEST NOT ISSUED		
		Analysis 5.3 Ensure adequate provision is made for rapid intervention if necessary (e.g., test safety and efficacy of vaccines against common canine pathogens).	SM SR SCz SCt SN SCl	FH CP				ANALYSIS REQUEST NOT ISSUED		
		Analysis 5.4 Drawing on PVA models (Analysis 1.1), evaluate the costs and benefits of pre-emptive vaccination of foxes in the wild, in captivity, and for release.	SM SR SCz SCt SN SCl	FH WP				ANALYSIS REQUEST NOT ISSUED		
	4c Evaluate and	TBD								

Updated 5/20/05

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	minimize other threats (e.g., vehicle strikes, invasive species).									
6 RESTORE HABITAT TO SUPPORT ISLAND FOX RECOVERY		Analysis 6.1 Evaluate the impact of environmental conditions (e.g. cover, prey availability) on fox vital rates in depressed or declining populations. Use this to generate recommendations for possible habitat restoration, as well as to identify promising foci for research on pre-release training and release sites.	SCz SCl	WP R EM				ANALYSIS REQUEST NOT ISSUED		
		Analysis 6.3 Develop recommendations for fennel control during pig eradication.	SCz	WP EM	6	Lyndal Laughrin	12/31/04	Analysis not yet delivered to RCG		

EXPERTISE GROUPS AND ELECTED CHAIRPERSONS			
GE	Golden Eagle	Dave Garcelon	garcelon@iws.org
G	Genetics	Colleen Lynch	clynch@lpzoo.org
R	Reintroduction	Dan Blumstein	marmots@ucla.edu
WP	Wild Population Management	Gary Roemer	groemer@nmsu.edu
FH	Fox Health	Linda Munson	lmunson@ucdavis.edu
R	Ecosystem Restoration	Lyndal Laughrin	laughrin@lifesci.ucsb.edu
PM	Population Modeling	Kathy Ralls	rallsk@thegrid.net
CP	Captive Population Management	Peter Siminski	psiminski@livingdesert.org